<u>IN THE CLAIMS</u>

Please amend claims 1, 9, 12, 16, 19, 24, and 26-31 as follows:

1.   (CURRENTLY AMENDED) A process for encoding data, comprising:

~~estimating forms of a plurality of functions~~determining a separate function for each frame in a sequence of frames, each function relating encoding size to encoded quality for each frame in ~~a~~the sequence of frames, each frame having data for an image;

prior to encoding any of the frames, performing a search of all ~~frames in the sequence of frames for~~of the separate functions to determine a best quality value for encoding the sequence of frames, whose encoded sizes satisfy one or more constraints, the constraints being associated with one of a transmission line bandwidth, a receiver buffer size and total compressed size~~, the estimating a best quality value being based in part on the functions~~;

encoding each frame of the entire sequence of frames with the determined best quality value;

determining whether each encoded frame satisfies the constraints; and

if the encoded frames satisfy the constraints, transmitting the sequence of encoded frames.

2.   (CANCELLED)

3.   (CANCELLED)

4.   (PREVIOUSLY PRESENTED) The process of claim 1, wherein the search reduces the search range for said best quality value by subdivision.

5.   (PREVIOUSLY PRESENTED) The process of claim 1 wherein said search is a subdivision search algorithm.

6.   (PREVIOUSLY PRESENTED) The process of claim 1 wherein said search is a binary search algorithm.

7.   (CANCELLED)

8.   (PREVIOUSLY PRESENTED) The process of claim 1, wherein each encoded frame produces a group of temporally encoded pictures.

-2-

G&C 30566.274-US-01

9.   (CURRENTLY AMENDED) The process of claim 1, wherein each act of ~~estimating one of the forms~~ determining a separate function, further comprises:

computing a plurality of pairs of encoded quality and encoded size values for each frame of the sequence from encoded frame data; and

determining a functional relationship between values of the encoded quality and the encoded size for the quality of frames from the pairs of values.

10.   (ORIGINAL) The process of claim 9, wherein the computing further comprises:

encoding each frame of the sequence with a plurality of qualities to compute encoded data sizes associated with each of the plurality of qualities.

11.   (CURRENTLY AMENDED) The process of claim 1, wherein the ~~estimating~~ determining of separate functions is performed across the sequence of frames on multiple processors in parallel.

12.   (CURRENTLY AMENDED) The process of claim 1, wherein the ~~estimating~~ determining of a best quality value, further comprises:

selecting an encoded image quality of one of the plurality of frames; and

deciding whether the encoded size associated with the encoded image quality satisfies a constraint based on one of transmission bandwidth, receiver buffering, total compressed size, and receiver prebuffering.

13.   (ORIGINAL) The process of claim 12, wherein the deciding is based on two of the transmission bandwidth, receiver buffering, and receiver prebuffering.

14.   (ORIGINAL) The process of claim 12, further comprising:

determining the encoded size associated with each encoded image quality from the form of the functional relation between the encoded quality and the encoded size for the associated frame.

15.   (ORIGINAL) The process of claim 10, wherein the transmitting comprises:

-3-

G&C 30566.274-US-01

selecting the one of the plurality of qualities having a closest value to the best quality value; and
wherein the transmitting sends frames encoded with the selected quality.

16.   (CURRENTLY AMENDED) A system for encoding image frames, the system
comprising:

    (a)   a controller connected to receive data on sizes of image frames that are part of a
sequence of image frames, to be encoded by the encoder and to control quality of the encoded frames
produced by the encoder based on:

        (i)   ~~an estimation of forms of a plurality of functions~~a determination of a separate
function for each image frame in the sequence of image frames, each function relating encoding
size to encoded quality for each frame in the sequence of frames;

        (ii)   a search of all ~~frames in the sequence of frames for~~ of the separate functions to
determine a best quality value for encoding the sequence of frames whose encoded sizes satisfy
one or more constraints, the constraints being associated with one of a bandwidth of a
transmission line, space in a receiver buffer and a total compressed size; and

    (b)   a variable bit rate encoder controlled by the controller configured to encode each frame
of the entire sequence of frames with the determined best quality value, wherein the controller is further
configured to determine whether each encoded frame satisfies the constraints, and if the encoded
frames satisfy the constraints, transmitting the sequence of encoded frames.

17.   (ORIGINAL) The system of claim 16, wherein the controller is configured to
determine a relation between quality of an encoded image frame and amount of encoded data from the
received size data.

18.   (ORIGINAL) The system of claim 16, wherein the controller is configured to
determine a best quality value for encoding an image frame from size data on data frames encoded with
different qualities.

19.   (CURRENTLY AMENDED) A computer readable program storage media storing a
computer program including executable instructions, the instructions to cause a computer to:

-4-

G&C 30566.274-US-01

~~estimate forms of a plurality of functions~~determine a separate function for each frame in a sequence of frames, each function relating encoded size to encoded quality for each frame in ~~a~~ the sequence of frames, each frame having data for an image;

prior to encoding any of the frames, perform a search of all ~~frames in the sequence of frames for~~ of the separate functions to determine a best quality value for encoding the sequence of frames whose encoded sizes satisfy one or more constraints, the constraints being associated with one or more of a transmission line bandwidth, a receiver buffer size and a total size constraint~~, the estimating a best quality value being based in part on the functions~~;

encode each frame of the entire sequence of frames with the ~~determined~~best quality value;

determine whether each encoded frame satisfies the constraints; and

if the encoded frames satisfy the constraints, order transmission of frames of the sequence.

20.   (CANCELLED)

21.   (PREVIOUSLY PRESENTED) The media of claim 19 wherein said search is a binary search algorithm.

22.   (CANCELLED)

23.   (PREVIOUSLY PRESENTED) The media of claim 19, wherein each encoded frame produces a group of temporally encoded pictures.

24.   (CURRENLTY AMENDED) The media of claim 19, wherein each instruction to ~~estimate one of the forms~~determine a separate function, further causes the computer to:

compute a plurality of pairs of encoded quality and encoded size values for each frame of the sequence from encoded frame data; and

determine a functional relationship between values of the encoded quality and the encoded size for the plurality of frames from the pairs of values.

25.   (ORIGINAL) The media of claim 24, wherein the instruction to compute further causes the computer to:

-5-

G&C 30566.274-US-01

encode each frame of the sequence with a plurality of qualities to computer encoded data sizes associated with each of the plurality of qualities.

26.   (CURRENTLY AMENDED) The media of claim 19, wherein the instruction to ~~estimate~~ determine a best quality value, further causes the computer to:

select an encoded image quality of one of the plurality of frames; and

decide whether the encoded size associated with the encoded image quality satisfies a constraint based on one of transmission bandwidth, receiver buffering, and receiver prebuffering.

27.   (CURRENTLY AMENDED) The process of claim 1 wherein if one of more of the encoded frames do not satisfy the constraints:

~~estimating~~ determining a new ~~form of the plurality of functions~~ separate function based on the prior ~~estimating~~ separate function determining and search; and

repeating the performing a search, encoding, and determining whether each encoded frame satisfies the constraints steps based on the new ~~form~~ function.

28.   (CURRENTLY AMENDED) The system of claim 16 wherein if one of more of the encoded frames do not satisfy the constraints, the controller:

~~estimates~~ determines a new ~~form of the plurality of functions~~ separate function based on the prior ~~estimating~~ separate function determining and search;

repeats the search of all of the frames;

causes the encoder to encode each frame of the entire sequence based on the new form; and

repeats the determining of whether each encoded frame satisfies the constraints.

29.   (CURRENTLY AMENDED) The system of claim 16, wherein the controller is configured to ~~estimate the forms~~ determine the separate functions across the sequence of frames on multiple processors in parallel.

30.   (CURRENTLY AMENDED) The media of claim 19 wherein if one of more of the encoded frames do not satisfy the constraints, the instructions cause the computer to:

-6-

G&C 30566.274-US-01

~~estimate a new form of the plurality of functions~~ determine a new separate function based on the prior ~~estimating~~ separate function determining and search; and

repeat the performing a search, encoding, and determining whether each encoded frame satisfies the constraints steps based on the new ~~form~~ function.

31.   (CURRENTLY AMENDED) The media of claim 19, wherein the instructions cause the computer to ~~estimate the forms~~ determine the functions across the sequence of frames on multiple processors in parallel.

-7-

G&C 30566.274-US-01